

STATE OF NEW HAMPSHIRE

**2004 Section 305(b) and 303(d)
Surface Water Quality Report**

**Volume 1 of 4
Assessment Methodology and
Summaries by Waterbody Type**

March, 2004



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STATE OF NEW HAMPSHIRE

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Assessment Methodology and
Summaries by Waterbody Type

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CHAPTER 1 INTRODUCTION

1.1 PURPOSE

The Federal Water Pollution Control Act [PL92-500, commonly called the Clean Water Act (CWA)], as last reauthorized by the Water Quality Act of 1987, requires each state to submit two surface water quality documents to the U.S. Environmental Protection Agency (EPA) every two years. Section 305(b) of the CWA requires submittal of a report (commonly called the “305(b) Report”), that describes the quality of its surface waters and an analysis of the extent to which all such waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water.

The second document is typically called the “303(d) List “ which is so named because it is a requirement of Section 303(d) of the CWA. The 303(d) List includes surface waters that are:

- impaired or threatened by a pollutant or pollutant(s),
- not expected to meet water quality standards within a reasonable time even after application of best available technology standards for point sources or best management practices for nonpoint sources and,
- require development and implementation of a comprehensive water quality study (i.e., called a Total Maximum Daily Load or TMDL study) that is designed to meet water quality standards.

The 2004 Section 305(b) and 303(d) Surface Water Quality Assessment Report is comprised of the following four volumes:

- Volume 1 – Assessment Methodology and Summaries by Waterbody Type
- Volume 2 – Individual Surface Water Assessments
- Volume 3 – Section 303(d) List
- Volume 4 – Additional Section 305(b) Submittal Requirements

The purpose of this document (Volume 1) is to provide the methodology for making assessments and a summary of the surface water quality assessment results for each of the following waterbody types:

- Estuaries
- Impoundments
- Lakes and Ponds
- Ocean (within State jurisdiction)
- Rivers and Streams
- Wetlands (not assessed this cycle)

Volume 2 includes assessment results for each individual surface water or assessment unit (AU). For this assessment cycle, surface waters in New Hampshire were divided into over 5000 individual AUs. Consequently, the list in Volume 2 is quite extensive.

Volume 3 includes the Section 303(d) List as described above.

Finally, Volume 4 includes additional CWA Section 305(b) submittal requirements such as analyses on the social and economic impacts of clean water and information on the nonpoint source program. Together, Volumes 1 through 4 fulfill Section 305(b)/303(d) reporting requirements.

1.2 ASSESSMENT METHODOLOGY AND TERMS

The 2004 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (i.e., the CALM) describes in detail how surface water quality assessment decisions were made. The CALM also includes descriptions and definitions of the many terms used in the assessment tables and lists presented in Volumes 1 through 3. A copy of the CALM is provided in Appendix B of this document for easy reference. Readers are strongly encouraged to read the CALM before reviewing assessments as it will help one to better understand and interpret assessment results.

1.3 DES SURFACE WATER QUALITY ASSESSMENT WEBSITE

Readers are also encouraged to visit the DES Surface Water Quality Assessment website at www.des.state.nh.us/wmb/swqa for downloadable copies of these documents as well as additional assessment information, lists and maps. The website also includes instructions to help find assessment information for any waterbody of interest. This includes one list sorted in alphabetical order by waterbody type and then waterbody name and another sorted by town/city, then waterbody type and then waterbody name. Using these lists the assessment unit number (or AUID) for any waterbody can be obtained. Knowing the AUID, Volumes 2 and 3 can be consulted to find assessment results.

CHAPTER 2 WATER RESOURCE ATLAS

2.1 OVERVIEW

While New Hampshire is not a large state in terms of land area or population, it is fortunate to have numerous lakes, ponds, rivers, streams, and estuaries. Though its coastline is limited, its tidal embayments are extensive. With an average of 40 inches of rainfall fairly evenly distributed throughout the year, New Hampshire's surficial aquifers are regularly replenished.

Table 2-1 provides a general overview of basic hydrologic data for New Hampshire. The State is divided into six major water basins: the Androscoggin, Coastal, Connecticut, Merrimack, Piscataqua and the Saco/Ossipee River basins.

The estimated number and acres of lakes, ponds and reservoirs shown on Table 2-1 are based upon New Hampshire's Assessment Units which are based on the 1:100,000 scale, National Hydrography Database (see Appendix B for details on how Assessment Units were created). The estimated miles of rivers and streams are less than that reported in the 2000 305(b) Report but are approximately the same as reported in 2002. The apparent reduction in the number of stream miles is a function of counting format. The previous value reported in 2000 of 10,881 miles included all of the "transport reaches" through lakes, impoundments, and estuaries. The number presented here represents free-flowing miles from the 1:100,000 National Hydrography Database. The slight decrease from 2002 (15 miles) reflects corrections to the Assessment Units; removal of 1:100,000 scale line work that does not reflect the route of any river or stream and start and end points of riverine impoundments.

The number and acreage of lakes, reservoirs and ponds reported on Table 2-1 are also based upon New Hampshire's Assessment Units which are based on the 1:100,000 scale, National Hydrography Database. The number and size of significant publicly owned lakes, reservoirs and ponds is from the DES, Watershed Management Bureau, Biology Section's database.

The category called Impoundment was new in 2002 and generally represents riverine impoundments or larger lake-like waters that exist because of the presence of a dam. In Table 2-1 impoundments have been broken out as greater than, or less than 10 acres to help reconcile differences between the 2004 and pre-2002 lake areas and counts.

With regard to the estuaries, a value of 17.7 square miles is reported this year versus 21.24 square miles in 2002 and 28.2 square miles in 2000. The 21.24 square mile estimate was computer generated by the New Hampshire Office of State Planning (NHOSP) and was based on 1:24,000 mapping. The apparent reduction in the square miles of estuaries from 2002 is a function of border position. The previous value stating 21.24 square miles includes all of the estuarine waters in New Hampshire as well as those that lie within Maine's jurisdiction on the Salmon Falls and Piscataqua Rivers.

The value reported this year was corrected to include only those estuaries that are in New Hampshire.

The Department's estimate of total waters is based on a scale of 1:100,000. Work is currently underway involving the University of New Hampshire Complex Systems, United States Geological Survey, and the National Mapping Division (and others) to develop a centerline coverage for all waters in New Hampshire consistent with the National Hydrography Dataset (NHD) at a scale of 1:24,000. When completed DES expects to use the 1:24,000 scale NHD to develop more accurate Assessment Units and estimates of total river / stream miles in the State.

Table 2-1: Surface Water Atlas

Topic	Value
State population as of July, 2003	1,275,000
Square miles of surface area	9,304
Number of major water basin	6
Total miles of rivers and streams ^{3,5}	9612
Miles of perennial rivers/streams ⁴	NC
Miles of intermittent streams ⁴	NC
Miles of ditches and canals ⁴	NC
Border miles of shared rivers/streams ⁶	310
Number of lakes/reservoirs/ponds ⁵	862
Number of impoundments <10 Acres ⁷	642
Number of impoundments >10 Acres ⁷	153
Number of significant publicly owned lakes/reservoirs/ponds ⁸	714
Number of significant publicly owned impoundments <10 Acres ^{7,8}	0
Number of significant publicly owned impoundments >10 Acres ^{7,8}	8
Acres of lakes/reservoirs/ponds ⁵	164,609
Acres/Miles of impoundments <10 Acres ⁷	1401 / 74
Acres/Miles of impoundments >10 Acres ⁷	20,352 / 168
Acres of significant publicly owned lakes/reservoirs/ponds ^{7,8}	157,719
Acres/Miles of significant publicly owned impoundments <10 Acres ^{7,8}	0 / 0
Acres/Miles of significant publicly owned impoundments >10 Acres ^{7,8}	396 / 5.18
Square miles of estuaries ^{1,10}	17.7
Miles of ocean coast ²	18
Acres of freshwater wetlands ⁹	400,000 - 600,000
Acres of tidal wetlands ⁹	7,500

Footnotes

1. NH Office of State Planning estimate based on 1:24,000 scale U.S. Geological Survey maps.
2. DES estimate based on 1:24,000 scale U.S. Geological Survey maps.
3. The apparent reduction in the number of stream miles is a function of counting format. The value of 10,881 miles reported in the 2000 305(b) Report included all of the "transport reaches" through lakes, impoundments, and estuaries. The number presented here represents free-flowing miles from the 1:100,000 National Hydrography Database.
4. NC means the value was not calculated.

5. Based upon New Hampshire's Assessment Units which are based on the 1:100,000 scale, National Hydrography Database.
6. DES estimate of river miles for the Connecticut River, Halls Stream, the Salmon Falls River and the Piscataqua River.
7. For the 2002 305(b)/303(d) Assessments, the New Hampshire Department of Environmental Services began mapping and evaluating riverine impoundments.
8. From the DES, Watershed Management Bureau, Biology Section, 2004.
9. N.H. Department of Environmental Services, Wetland Bureau, ANNUAL REPORT, FY 2002 <http://www.des.state.nh.us/pdf/Wetlands02.pdf>
10. The 2002 305(b)/303(d) Assessment reported a value of 21.24 square miles of estuaries. This however included all estuarine waters in New Hampshire as well on the Maine side of the Salmon Falls and Piscataqua Rivers (3.73 square miles). The lower value reported this year was corrected to only include estuarine waters that lie in New Hampshire.

CHAPTER 3 ASSESSMENT SUMMARIES

3.1 OVERALL USE SUPPORT SUMMARY

For each waterbody type, the following table shows the total size that is attaining or not attaining standards as well as the total size of waters that could not be assessed due to insufficient information. Definitions for each category are provided at the bottom of the Table 3-1. The size of waters attaining one or more uses, and which have no known waters that are threatened or impaired, are included in Categories 1 and 2. Waters which could not be assessed for any designated use due to a lack of information are included under Category 3. Impaired or threatened waters are represented by Categories 4A, 4B, 4C and 5.

As shown, all waters are considered impaired. This is primarily due to Statewide fish and shellfish consumption advisories issued for all surface waters because of elevated levels of mercury in fish/shellfish tissue (NHDES, 2000). For comparison purposes, Table 3-2 and Figure 3-1 show what the overall use support would be if the mercury issue was resolved and the Statewide mercury fish/shellfish consumption advisory was no longer in effect.

Table 3-1: Overall Use Support (including Statewide mercury impairment)

Waterbody Type	Units	Assessment Category					Total Size
		1	2	3	4A, 4B or 4C	5	
Estuaries	Square Miles	0	0	0	0	17.70	17.70
Impoundments	Acres	0	0	0	0	21,752.44	21,752.44
Lakes and Ponds	Acres	0	0	0	0	164,609.13	164,609.13
Ocean (within State jurisdiction)	Square Miles	0	0	0	0	70.20	70.20
Rivers and Streams	Miles	0	0	0	0	9611.95	9611.95
Wetlands	Acres	Not Assessed – See Section 3.7					

*Notes:

Category 1: Attaining the water quality standard and no use is threatened.

Category 2: Attaining some of the designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened (i.e., more data is needed to assess some of the uses).

Category 3: Insufficient or no data and information is available to determine if any designated use is attained (i.e., more monitoring is needed to assess any use).

Category 4A: Impaired or threatened for one or more designated uses but does not require the development of a TMDL because a TMDL has been completed.

Category 4B: Impaired or threatened for one or more designated uses but does not require the development of a TMDL because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future.

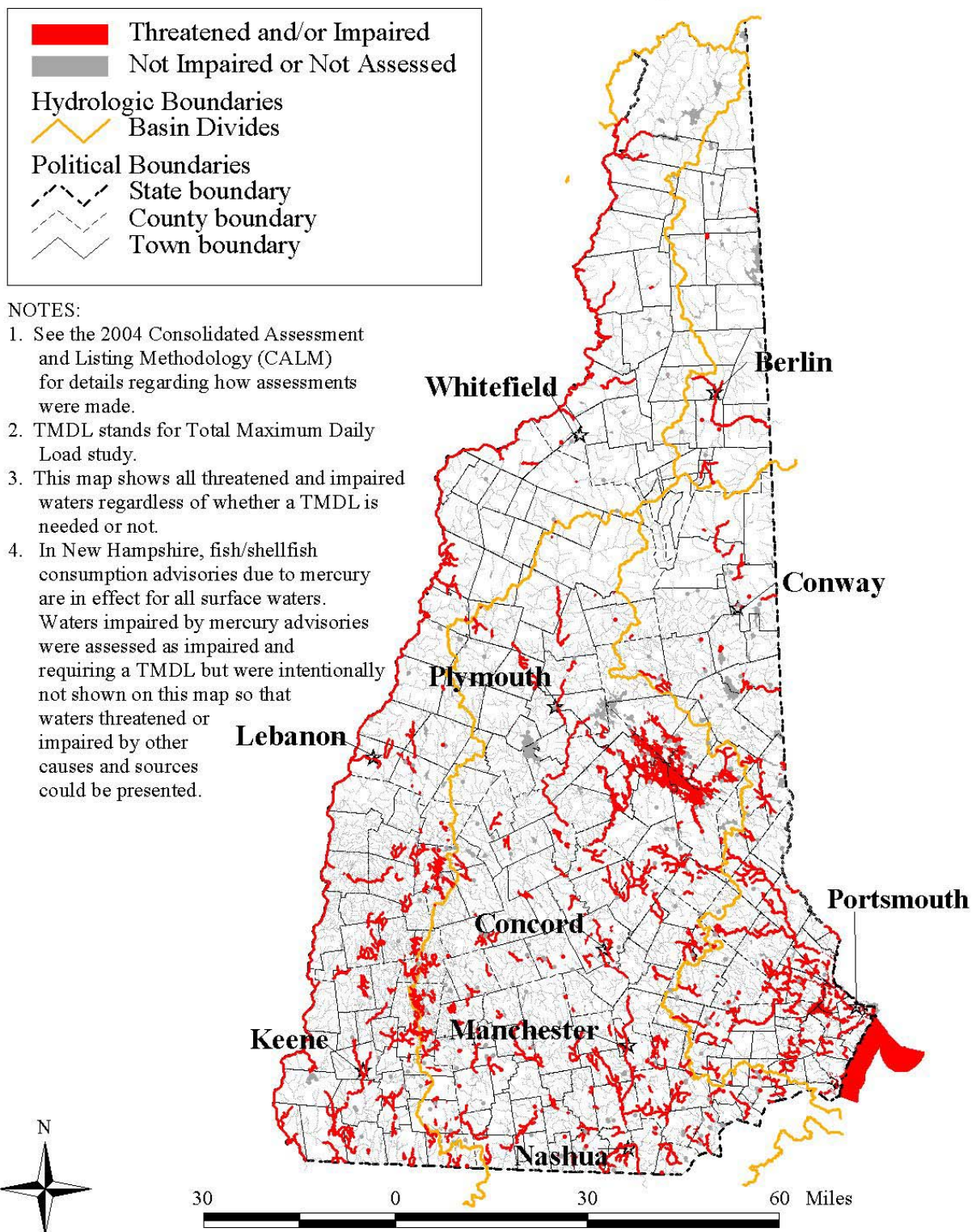
Category 4C: Impaired or threatened for one or more designated uses but does not require the development of a TMDL because the impairment is not caused by a pollutant, and

Category 5: Impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL (this is the 303(d) List).

Table 3-2: Overall Use Support (excluding Statewide mercury impairment*)

Waterbody Type	Units	Assessment Category					Total Size
		1	2	3	4A, 4B or 4C	5	
Estuaries	Square Miles (%)	0.00 (0.0%)	0.00 (0.0%)	0.00 (0.0%)	0.00 (0.0%)	17.70 (100.0%)	17.70 (100.0%)
Impoundments	Acres (%)	0.00 (0.0%)	9079.38 (41.7%)	0.00 (0.0%)	1110.9 (5.1%)	11562.16 (53.2%)	21752.44 (100.0%)
Lakes and Ponds	Acres (%)	0.00 (0.0%)	79341.86 (48.2%)	0.00 (0.0%)	66237.34 (40.2%)	19029.93 (11.6%)	164609.13 (100.0%)
Ocean (within State jurisdiction)	Square Miles (%)	0.00 (0.0%)	0 (0.0%)	0.00 (0.0%)	00.00 (0.0%)	70.20 (100.0%)	70.20 (100.0%)
Rivers and Streams	Miles (%)	0.00 (0.0%)	8148.11 (84.8%)	0.00 (0.0%)	92.73 (1.0%)	1371.12 (14.2%)	9611.95 (100.0%)
Wetlands	Acres	Not Assessed. See Section 3.7					

*All surface waters are impaired for fish consumption and shellfishing due to statewide fish/shellfish consumption advisories due to mercury.

Figure 3-1: Map of All Impaired Surface Waters (Excluding Mercury)**2004: All Threatened and/or Impaired Waters**

3.2 **ESTUARIES ASSESSMENT SUMMARY**

3.2.1 Individual Designated Use Support Summary

The following table provides a summary of the use support status for all designated uses in estuarine waters.

Table 3-3: Estuaries: Individual Designated Use Support

Use	Fully Supporting Square Miles (%)	Not Supporting Square Miles (%)	Insufficient Information Square Miles (%)	Not Assessed Square Miles (%)	Total Size Square Miles (%)	Threatened Square Miles (%)
Aquatic Life	6.77 (38.2%)	2.34 (13.2%)	7.91 (44.7%)	0.69 (3.9%)	17.7 (100.0%)	0.09 (0.5%)
Fish Consumption*	0.00 (0.0%)	17.70 (100.0%)	0.00 (0.0%)	0.00 (0.0%)	17.7 (100.0%)	0.00 (0.0%)
Primary Contact Recreation	8.66 (48.9%)	4.18 (23.6%)	4.37 (24.7%)	0.49 (2.8%)	17.7 (100.0%)	0.00 (0.0%)
Secondary Contact Recreation	13.34 (75.4%)	0.15 (0.9%)	0.69 (3.9%)	3.52 (19.9%)	17.7 (100.0%)	0.00 (0.0%)
Shellfishing*	0.00 (0.0%)	17.70 (100.0%)	0.00 (0.0%)	0.00 (0.0%)	17.7 (100.0%)	0.00 (0.0%)
Wildlife	0.00 (0.0%)	0.00 (0.0%)	0.00 (0.0%)	17.7 (100.0%)	17.7 (100.0%)	0.00 (0.0%)

*All surface waters are impaired for fish consumption and shellfishing due to statewide fish/shellfish consumption advisories due to mercury.

3.2.2 Causes (Pollutants and Nonpollutants) of Impairment

Table 3-4 shows the total square miles of estuaries impaired or threatened by various pollutants and nonpollutants (i.e. causes of impairment).

Table 3-4: Estuaries: Total Size of Waters Impaired by Causes

Impairment		Total Size (Square Miles)
1	Mercury	17.70
2	Dioxin	17.70
3	Polychlorinated biphenyls (PCBs)	17.70
4	Enterococcus	4.18
5	Total Fecal Coliform	3.43
6	Other flow regime alterations	1.24
7	Dissolved Oxygen (Saturation)	1.10
8	Chlorophyll a	0.47
9	Copper	0.09

3.2.3 Sources of Impairment

Table 3-5 shows the total square miles of estuaries impaired or threatened by various sources of impairment.

Table 3-5: Estuaries: Total Size of Waters Impaired by Sources

Source of Impairment		Total Size (Square Miles)
1	Atmospheric Deposition – Toxics	17.70
2	Source Unknown	17.70
3	Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)	2.66
4	Combined Sewer Overflows	1.73
5	Littoral/shore Area Modifications (Non-riverine)	1.24
6	Sanitary Sewer Overflows (Collection System Failures)	1.10
7	Unpermitted Discharge (Domestic Wastes)	0.88
8	Animal Feeding Operations (NPS)	0.47
9	Illicit Connections/Hook-ups to Storm Sewers	0.36
10	Municipal Point Source Discharges	0.09

3.3 **IMPOUNDMENTS ASSESSMENT SUMMARY**

3.3.1 Individual Designated Use Support

The following table provides a summary of the use support status for all designated uses in all impoundments.

Table 3-6: Impoundments: Individual Designated Use Support

Use	Fully Supporting Acres (%)	Not Supporting Acres (%)	Insufficient Information Acres (%)	Not Assessed Acres (%)	Total Size Acres (%)	Threatened Acres (%)
Aquatic Life	0.00 (0.0%)	2,157.18 (9.9%)	9,798.61 (45.0%)	9,796.65 (45.0%)	21,752.44 (100.0%)	9.00 (0.0%)
Drinking Water After Adequate Treatment	3,555.68 (16.3%)	0.00 (0.0%)	0.00 (0.0%)	18,196.76 (83.7%)	21,752.44 (100.0%)	0.00 (0.0%)
Fish Consumption*	0.00 (0.0%)	21,752.44 (100.0%)	0.00 (0.0%)	0.00 (0.0%)	21,752.44 (100.0%)	0.00 (0.0%)
Primary Contact Recreation	2,339.67 (10.8%)	1,063.78 (4.9%)	908.24 (4.2%)	17,440.75 (80.2%)	21,752.44 (100.0%)	0.00 (0.0%)
Secondary Contact Recreation	2,783.45 (12.8%)	2.00 (0.0%)	534.74 (2.5%)	18,432.25 (84.7%)	21,752.44 (100.0%)	0.00 (0.0%)
Wildlife	0.00 (0.0%)	0.00 (0.0%)	0.00 (0.0%)	21,752.44 (100.0%)	21,752.44 (100.0%)	0.00 (0.0%)

*All surface waters are impaired for fish consumption and shellfishing due to statewide fish/shellfish consumption advisories due to mercury.

3.3.2 Causes (Pollutants and Nonpollutants) of Impairment

Table 3-7 shows the total acres of impoundments impaired or threatened by various pollutants and nonpollutants (i.e. causes of impairment).

Table 3-7: Impoundments: Total Size of Waters Impaired by Causes

Impairment		Total Size (Acres)
1	Mercury	21,752.44
2	Polychlorinated biphenyls (PCBs)	9,470.00
3	pH	1,268.88
4	Escherichia coli	1,003.78
5	Non-Native Aquatic Plants	839.30
6	Dissolved Oxygen (Saturation)	594.00
7	Dioxin (including 2,3,7,8-TCDD)	384.10
8	Dissolved Oxygen (Concentration)	152.00
9	Chlorophyll-a	84.00

3.3.3 Sources of Impairment

Table 3-8 shows the total acres of impoundments impaired or threatened by various sources of impairment.

Table 3-8: Impoundments: Total Size of Waters Impaired by Sources

Source of Impairment		Total Size (Acres)
1	Atmospheric Deposition – Toxics	21,752.44
2	Source Unknown	11,660.94
3	Combined Sewer Overflows	562.00
4	Industrial Point Source Discharge	393.10
5	Illicit Connections/Hook-ups to Storm Sewers	238.50
6	Municipal Point Source Discharges	66.00
7	Municipal (Urbanized High Density Area)	60.00
8	Atmospheric Deposition - Acidity	55.00
9	Pollutants from Public Bathing Areas	5.52

3.4 **LAKES AND PONDS ASSESSMENT SUMMARY**

3.4.1 Individual Designated Use Support Summary

The following table provides a summary of the use support status for all designated uses in all lakes and ponds.

Table 3-9: Lakes and Ponds: Individual Designated Use Support

Use	Fully Supporting Acres (%)	Not Supporting Acres (%)	Insufficient Information Acres (%)	Not Assessed Acres (%)	Total Size Acres (%)	Threatened Acres (%)
Aquatic Life	7,808.42 (4.7%)	78,004.13 (47.4%)	76,358.52 (46.4%)	2,438.06 (1.5%)	164,609.13 (100.0%)	0.00 (0.0%)
Drinking Water After Adequate Treatment	9,514.15 (5.8%)	921.40 (0.6%)	0.00 (0.0%)	154,173.58 (93.7%)	164,609.13 (100.0%)	0.00 (0.0%)
Fish Consumption*	0.00 (0.0%)	164,609.13 (100.0%)	0.00 (0.0%)	0.00 (0.0%)	164,609.13 (100.0%)	0.00 (0.0%)
Primary Contact Recreation	90,500.79 (55.0%)	1,405.68 (0.9%)	69,036.14 (41.9%)	3,666.52 (2.2%)	164,609.13 (100.0%)	0.00 (0.0%)
Secondary Contact Recreation	91,336.45 (55.5%)	23.22 (0.0%)	65,370.51 (39.7%)	7,878.95 (4.8%)	164,609.13 (100.0%)	0.00 (0.0%)
Wildlife	0.00 (0.0%)	0.00 (0.0%)	0.00 (0.0%)	164,609.13 (100.0%)	164,609.13 (100.0%)	0.00 (0.0%)

*All surface waters are impaired for fish consumption and shellfishing due to statewide fish/shellfish consumption advisories due to mercury.

3.4.2 Causes (Pollutants and Nonpollutants) of Impairment

Table 3-10 shows the total acres of lakes and ponds impaired or threatened by various pollutants and nonpollutants (i.e. causes of impairment).

Table 3-10: Lakes and Ponds: Total Size of Waters Impaired by Causes

Impairment		Total Size (Acres)
1	Mercury	164,609.13
2	Non-Native Aquatic Plants	68,239.17
3	pH	11,321.36
4	Polychlorinated biphenyls (PCBs)	5249.9
5	Excess Algal Growth	921.40
6	Cyanobacteria hepatotoxic microcystins	701.36
7	Other Flow Regime Alterations	520.00
8	Chlorophyll-a	411.19
9	Dissolved Oxygen (Saturation)	298.10
10	Escherichia coli	274.48
11	Aluminum	212.80
12	Sedimentation/Siltation	23.22
13	Dissolved Oxygen (Concentration)	5.50

3.4.3 Sources of Impairment

Table 3-11 shows the total acres of lakes and ponds impaired or threatened by various sources of impairment.

Table 3-11: Lakes and Ponds: Total Size of Waters Impaired by Sources

Source of Impairment		Total Size (Acres)
1	Atmospheric Deposition – Toxics	164,609.13
2	Source Unknown	74,586.21
3	Atmospheric Deposition – Acidity	11,321.36
4	Transfer of Water from an Outside Watershed	548.00
5	Littoral Area Modifications (Non-riverine)	520.00
6	Municipal (Urbanized High Density Area)	405.00
7	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	222.00
8	Package Plant or Other Permitted Small Flows Discharges	142.20
9	Residential Districts	62.20
10	Flow Alterations from Water Diversions	42.40
11	Industrial Point Source Discharge	21.00
12	Discharges from Municipal Separate Storm Sewer Systems (MS4)	19.93
13	Pollutants from Public Bathing Areas	19.64
14	Commercial Districts (Shopping/Office Complexes)	17.60
15	Highway/Road/Bridge Runoff (Non-construction Related)	15.50
16	Animal Feeding Operations (NPS)	14.80
17	Post-development Erosion and Sedimentation	3.29

3.4.4 Trophic Status of Significant Publicly Owned Lakes

The trophic status of significant publicly owned lakes are presented in Table 3-12. Definitions of each trophic status and descriptions of how they are determined may be found in the 2000 Section 305(b) Report (NHDES, 2000), which is available on the DES website at www.des.state.nh.us/wmb/swqa. Note that Table 3-12 does not agree with the corresponding ADB report as the AUID for some public lakes are coded as impoundments (i.e., NHIMP.....), which the ADB will not recognize as significantly publicly owned lakes.

Table 3-12: Trophic Status of Significant Publicly Owned Lakes

Trophic Status	Number of Lakes *	Total Size * (Acres)
Oligotrophic	200	115,275.3
Mesotrophic	357	33,634.1
Eutrophic	152	7142.3
Hypereutrophic	0	0.0
Dystrophic	0	0.0
Unknown	13	146.4

*Note: Values include some impoundments which are considered Significant Publicly Owned Lakes.

3.5 **OCEAN (WITHIN STATE JURISDICTION) ASSESSMENT SUMMARY**

3.5.1 Individual Designated Use Support Summary

The following table provides a summary of the use support status for all designated uses in all ocean waters within State jurisdiction.

Table 3-13: Ocean: Individual Designated Use Support

Use	Fully Supporting Square Miles (%)	Not Supporting Square Miles (%)	Insufficient Information Square Miles (%)	Not Assessed Square Miles (%)	Total Size Square Miles (%)	Threatened Square Miles (%)
Aquatic Life	0.00 (0.0%)	0.00 (0.0%)	0.03 (0.0%)	70.17 (100.0%)	70.20 (100.0%)	0.00 (0.0%)
Fish Consumption*	0.00 (0.0%)	70.2 (100.0%)	0.00 (0.0%)	0.00 (0.0%)	70.20 (100.0%)	0.00 (0.0%)
Primary Contact Recreation	3.88 (5.5%)	0.39 (0.6%)	0.00 (0.0%)	65.94 (93.9%)	70.20 (100.0%)	0.00 (0.0%)
Secondary Contact Recreation	3.91 (5.6%)	0.08 (0.1%)	0.03 (0.0%)	66.19 (94.3%)	70.20 (100.0%)	0.00 (0.0%)
Shellfishing*	0.00 (0.0%)	70.20 (100.0%)	0.00 (0.0%)	0.00 (0.0%)	70.20 (100.0%)	0.00 (0.0%)
Wildlife	0.00 (0.0%)	0.00 (0.0%)	0.00 (0.0%)	70.2 (100.0%)	70.20 (100.0%)	0.00 (0.0%)

*All surface waters are impaired for fish consumption and shellfishing due to statewide fish/shellfish consumption advisories due to mercury.

3.5.2 Causes (Pollutants and Nonpollutants) of Impairment

Table 3-14 shows the total square miles of ocean waters within State jurisdiction impaired or threatened by various pollutants and nonpollutants (i.e. causes of impairment).

Table 3-14: Ocean: Total Size of Waters Impaired by Causes

Impairment		Total Size (Square Miles)
1	Mercury	70.20
2	Dioxin	70.20
3	Polychlorinated biphenyls (PCBs)	70.20
4	Enterococcus	0.39
5	Total Fecal Coliform	0.21

3.5.3 Sources of Impairment

Table 3-15 shows the total square miles of ocean waters within State jurisdiction impaired or threatened by various sources of impairment.

Table 3-15: Ocean: Total Size of Waters Impaired by Sources

Source of Impairment		Total Size (Acres)
1	Atmospheric Deposition – Toxics	70.22
2	Source Unknown	70.22
3	Unpermitted Discharge (Domestic Wastes)	0.05
4	Waterfowl	0.05

3.6 **RIVERS AND STREAMS ASSESSMENT SUMMARY**

3.6.1 Individual Designated Use Support Summary

The following table provides a summary of the use support status for all designated uses in rivers and streams.

Table 3-16: Rivers and Streams: Individual Designated Use Support

Use	Fully Supporting Miles (%)	Not Supporting Miles (%)	Insufficient Information Miles (%)	Not Assessed Miles (%)	Total Size Miles (%)	Threatened Miles (%)
Aquatic Life	162.57 (1.7%)	1,090.59 (11.3%)	1,060.85 (11.0%)	7,297.95 (75.9%)	9,611.95 (100.0%)	15.57 (0.2%)
Drinking Water After Adequate Treatment	330.16 (3.4%)	0.00 (0.0%)	0.00 (0.0%)	9,281.80 (96.6%)	9,611.95 (100.0%)	0.00 (0.0%)
Fish Consumption*	0.00 (0.0%)	9,611.95 (100.0%)	0.00 (0.0%)	0.00 (0.0%)	9,611.95 (100.0%)	0.00 (0.0%)
Primary Contact Recreation	891.21 (9.3%)	441.31 (4.6%)	252.49 (2.6%)	8,023.94 (83.5%)	9,611.95 (100.0%)	0.00 (0.0%)
Secondary Contact Recreation	1,269.63 (13.2%)	35.41 (0.4%)	216.40 (2.3%)	8,090.52 (84.2%)	9,611.95 (100.0%)	0.00 (0.0%)
Wildlife	0.00 (0.0%)	0.00 (0.0%)	0.00 (0.0%)	9,611.95 (100.0%)	9,611.95 (100.0%)	0.00 (0.0%)

*All surface waters are impaired for fish consumption and shellfishing due to statewide fish/shellfish consumption advisories due to mercury.

3.6.2 Causes (Pollutants and Nonpollutants) of Impairment

Table 3-17 shows the total miles of rivers and streams impaired or threatened by various pollutants and nonpollutants (i.e. causes of impairment).

Table 3-17: Rivers and Streams: Total Size of Waters Impaired by Causes

Impairment		Total Size (Miles)
1	Mercury	9,611.95
2	pH	877.38
3	Escherichia coli	422.19
4	Polychlorinated biphenyls (PCBs)	176.05
5	Dissolved Oxygen (Concentration)	151.10
6	Aluminum	104.48
7	Benthic-Macroinvertebrates Bioassessments (Streams)	100.91
8	Dissolved Oxygen (Saturation)	81.88
9	Habitat Assessment (Streams)	59.02
10	Non-Native Aquatic Plants	34.92
11	Copper	29.43
12	Iron	23.23
13	Other flow regime alterations	22.53
14	Dioxin (including 2,3,7,8-TCDD)	18.19
15	Chloride	15.41
16	Zinc	11.02
17	Lead	10.02
18	Arsenic	5.77
19	Chlorophyll-a	5.68
20	Cadmium	5.27
21	Manganese	3.00
22	Foam/Flocs/Scum	2.38
23	Chromium (total)	0.50
24	DDD	0.50
25	Benzo(a)pyrene (PAHs)	0.20

3.6.3 Sources of Impairment

Table 3-18 shows the total miles of rivers and streams impaired or threatened by various sources of impairment.

Table 3-18: Rivers and Streams: Total Size of Waters Impaired by Sources

	Source of Impairment	Total Size (Miles)
1	Atmospheric Deposition – Toxics	9,611.95
2	Source Unknown	1,311.22
3	Combined Sewer Overflows	49.50
4	Municipal Point Source Discharges	31.84
5	Illicit Connections/Hook-ups to Storm Sewers	29.30
6	Industrial Point Source Discharge	28.62
7	Landfills	26.53
8	Streambank Modifications/Destabilization	15.67
9	Municipal (Urbanized High Density Area)	11.62
10	Commercial Districts (Shopping/Office Complexes)	9.05
11	Highway/Road/Bridge Runoff (Non-construction Related)	9.05
12	Livestock (Grazing or Feeding Operations)	8.01
13	Impacts from Hydrostructure Flow Regulation/modification	6.86
14	Acid Mine Drainage	5.25
15	Unpermitted Discharge (Domestic Waste)	2.38
16	Unpermitted Discharge (Industrial/commercial Wastes)	2.38
17	Airports	1.00
18	Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)	0.74
19	Animal Feeding Operations	0.30
20	Petroleum/Natural Gas Activities (Legacy)	0.20
21	Pollutants from Public Bathing Areas	0.03

3.7 **WETLANDS ASSESSMENT SUMMARY**

New Hampshire highly values its wetland resources and has an excellent program for minimizing the net loss of wetlands throughout the state. Appendix C includes a description of the New Hampshire's wetlands program including state regulations, interaction with federal regulations and status of water quality standards development.

For this cycle, it was not possible to conduct assessments like those presented for the other waterbody types because the wetlands have not been indexed (i.e., assigned Assessment Unit Identification Numbers) and quantitative assessment criteria for wetlands have not yet been developed. Discussions are, however, underway to determine the resources necessary to address these needs with the goal of being able to assess wetlands in the future.

3.8 **PROBABILISTIC ASSESSMENT SUMMARY**

The tables below show the results of the probabilistic assessments which were conducted for the aquatic life, primary contact recreation and secondary contact recreation uses in estuaries. Details regarding how this assessment was made may be found in Appendix A. A general discussion of probabilistic assessments is provided in the 2004 Consolidated Assessment and Listing Methodology, a copy of which is included in Appendix B.

Table 3-19: Estuaries: Aquatic Life Probabilistic Assessment

Use Support	Percent of Estuary	Lower CL*	Upper CL*	Square Miles
Fully Supporting	59.11%	41.09%	77.13%	10.20
Not Supporting	0.35%	0.00%	1.76%	0.06
Insufficient Information	40.13%	22.12%	58.14%	6.93
Not Assessed	0.42%	0.00%	1.94%	0.07
Total	100.00%			17.26

- Lower and Upper CI represent the lower and upper bounds of the 95th percentile confidence limits of the percentage.

Table 3-20: Estuaries: Primary Contact Recreation Probabilistic Assessment

Use Support	Percent of Estuary	Lower CL*	Upper CL*	Square Miles
Fully Supporting	86.83%	60.76%	100.00%	15.37
Not Supporting	2.82%	0.00%	29.53%	0.50
Insufficient Information	3.93%	0.00%	40.67%	0.70
Not Assessed	6.41%	0.00%	13.00%	1.14
Total	100.00%			17.70

- Lower and Upper CI represent the lower and upper bounds of the 95th percentile confidence limits of the percentage.

Table 3-21: Estuaries: Secondary Contact Recreation Probabilistic Assessment

Use Support	Percent of Estuary	Lower CL*	Upper CL*	Square Miles
Fully Supporting	90.76%	64.89%	100.00%	16.06
Not Supporting	2.13%	0.00%	28.78%	0.38
Insufficient Information	0.70%	0.00%	37.26%	0.12
Not Assessed	6.41%	0.00%	13.00%	1.14
Total	100.00%			17.70

- Lower and Upper CI represent the lower and upper bounds of the 95th percentile confidence limits of the percentage.

CHAPTER 4 REFERENCES

NHDES, 2000. State of New Hampshire 2000 305(b) Water Quality Report. NHDES-WD-00-4. New Hampshire Department of Environmental Services.

NHDES, 2004. Probabilistic Assessment of Tidal Waters. Memorandum by Philip Trowbridge. January 30, 2004. New Hampshire Department of Environmental Services.

APPENDIX A: Probabilistic Assessment Details

APPENDIX B: 2004 Consolidated Assessment and Listing Methodology (CALM)

APPENDIX C: NH Wetlands Program